CT-905

THREE HEAD CLOSED LOOP CASSETTE TAPE RECORDER

FINE ARTS by GRUNDIG

On/Off (POWER) Button
(pressed = on)

EJECT Button
Opens cassette compartment
(press only with "stop" selected)

Cassette compartment

MEMO Button
For storing a stop position

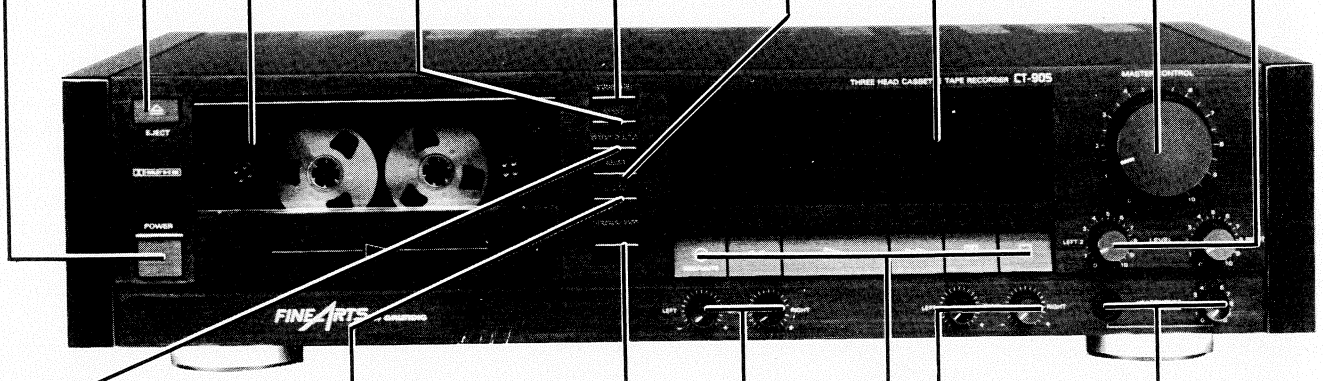
0-SET Button
Resets tape counter

MPX Button FILTER
For filtering out interferences when recording from FM stereo broadcasts

Display

Master Recording Level Control
Provides a common drive for the two channels

Recording Level Controls – Precontrol
For preadjusting the two channels separately



TIMER
(stepping button)
For timer operation

Stepping Button
For noise reduction systems
DOLBY B-C NR

SOURCE/TAPE
Button for switching between pre-/off-tape monitoring

CAL Controls
For calibration

BIAS Controls
For tape matching

Headphone Socket
(6.3 mm jack plug)
with headphone volume control (eg: for monitoring the recording) next to it

▷ TIMER activated
↓
REC TIMER activated
↓
Timer function off

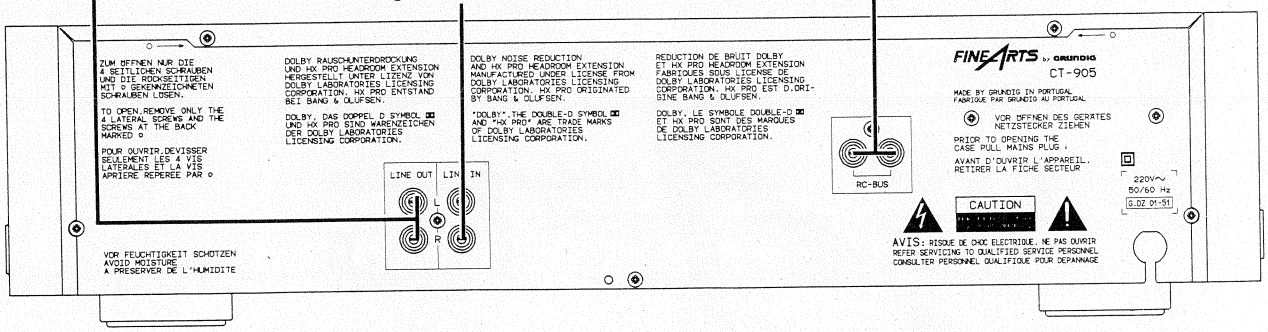
DOLBY B NR on
↓
DOLBY C NR on
↓
DOLBY NR off

Drive Mechanism Buttons
- ○ - Record
- ◁◁ - Rewind
- ▷ - Start
- ▷▷ - Forward wind
- ▯▯ - Pause
- □ - Stop

LINE OUT Output
For playback/monitoring during recording

LINE IN Input
For recording
L = left-hand channel
R = right-hand channel

RC-BUS Sockets for connecting a system remote control according to the RC-5 code. (Each usable as input or as output to further suitable units).



Positioning the Cassette Deck

Please note...

Do not cover the ventilation slots on top of the unit.

If several units are mounted on top of each other, the cassette deck should be at a lower position.

If the cassette deck is operated in a closed wall cabinet, hifi rack etc., adequate ventilation must be provided. Do not expose the cassette deck to temperatures above 70° C.

In the case the unit is too wide, the wooden side panels can be taken off by removing the lateral screws. Do not forget to screw the screws back into the unit.

Note:

If units are placed above each other (in a rack or free-standing), we recommend the following arrangement:
From bottom to top: cassette deck, tuner, CD player, amplifier.

If a humming noise is noticed from the cassette deck, reverse the mains plug of the component situated directly above the deck.

Mains Connection

- The cassette deck must only be connected to a mains supply of 220 V ± 10 %, 50/60 Hz (GB: 240 V, 50 Hz).
- Please also note the information on the back of the deck.

Additional Information for Units Sold in Great Britain
Units sold in GB are suitable for operation from a 240 V AC, 50 Hz mains supply. We recommend that a 13 amp 3-pin plug fitted with a 3 amp fuse be used. The brown lead must be connected to the live pin (marked 'L' or 'brown' or 'red') and the blue lead to the neutral pin (marked 'N' or 'blue' or 'black'). On no account should either wire be connected to the earth pin (marked 'E' or 'green/yellow'). If other mains plugs are used, ensure that they are protected by a 5 amp fuse.

Audio Signal Connections

LINE IN Sockets

Connect the sockets via a cable with phono plugs to the output (eg: LINE OUT) of the amplifier. R = right channel, L = left channel.

LINE OUT Sockets

Connect the sockets via a cable with phono plugs to the input (eg: LINE IN) of the amplifier. R = right channel, L = left channel.

HEADPHONES Socket

– For stereo headphones with 6.3 mm jack plug.
The monitoring volume can be adjusted with the control next to it.

Switching On and Off

To switch on

- Press the mains switch marked POWER (lock in): the "on" indicator lights up.

To switch off

- Press the mains switch marked POWER a second time (release).

The set remains connected to the mains voltage even if it is switched off. The set can only be completely disconnected from the mains by unplugging it from the wall socket.

Inserting the Cassette

- Open the cassette compartment with the EJECT button.
- Insert cassette with open edge downwards into guides in cassette compartment lid.
- Close cassette compartment by hand.

Tape Type

Use iron oxide (I/Fe), chromium dioxide (II/Cr) or metal (IV/Me) cassettes. The unit switches automatically to the tape type used and the upper part of the display will show this with Fe/120µs, Cr/70µs or Me/70µs.
The unit has been adjusted in the factory by means of an IEC II tape. The CAL and BIAS controls are in mid position during this.
If tapes deviating from this are used, the unit can be optimally matched to the tape with the CAL and BIAS controls using the "FINE ARTS Test-CD". For this, see "Calibration".

Noise Reduction System (DOLBY NR)

Always play back a cassette in the same way as it was recorded, ie: record and playback should be both **with** or **without** DOLBY NR (B-type or C-type) selected. It is only under these conditions, that playback quality will be optimum.
The advantage of recording with DOLBY NR over recording without DOLBY NR is a noticeably better signal-to-noise ratio, ie: the ratio of the volume of the useful signal (eg: music) to the inherent noise.
B-type or C-type NR? The "DOLBY C-type NR system" is a further development of the "DOLBY B-type NR system" with better noise reduction over a wider frequency range.
For this reason, always select the C-type NR when making new recordings.
If a commercially pre-recorded cassette only shows the DD symbol, the recording was made with the DOLBY B-type NR system.
HX PRO (Headroom Extension) – This facility acts, especially in conjunction with the DOLBY NR system, like a dynamic premagnetization which always ensures an optimum recording level of the highs.
The HX PRO system is functioning during record. Cassettes recorded with the HX PRO system can be played back on any other unit (even without HX PRO facility) retaining the advantages of HX PRO.

- Select the DOLBY NR type required with the DOLBY B-C NR stepping button: Display indication DOLBY B or DOLBY C.
- To switch off the DOLBY NR system, repeatedly press the DOLBY B-C NR button until none of the DOLBY NR indications are lit.

Dolby noise reduction and HX PRO headroom extension manufactured under licence from Dolby Laboratories Licensing Corporation. HX PRO originated by Bang and Olufsen. "Dolby", the double-D symbol and "HX PRO" are trademarks of Dolby Laboratories Licensing Corporation.

Playback

- Insert cassette.
- Press the DOLBY B-C NR button to correspond to the manner of recording (see "Noise Reduction System").
- Start playback with button ▷.

– The unit switches automatically to tape reproduction TAPE (display indication TAPE) if it still was in the basic or switch-on position SOURCE (through-connection to sound source).

- To interrupt playback press the pause button ▯▯.

– To restart playback press the start button ▷.

- To stop playback press the stop button □.

Fast Wind

- For fast rewind: press button ◁◁.
- For fast forward wind: press button ▷▷.
- To stop fast wind: press stop button □.

Tape-End Switch-Off

The unit automatically switches to stop in all tape running functions when the end of tape is reached.

Recording

Warning:
Copyright – in copying material copyright must not be infringed.

Preparation for Recording
The unit must be correctly connected and ready for operation; the same applies to the programme source (eg: tuner, record deck, etc.).

- For recording with or without DOLBY NR (B-type or C-type), press the DOLBY B-C NR button as appropriate (see section headed "Noise Reduction System").
- Press record button REC/MUTE: the unit switches to recording/pause, as can be seen in the display.

– If a cassette protected against erasure is inserted, no recording will be possible (see also section headed "Erasing and Protecting Against Accidental Erasure").

– If the unit is set to the function TAPE (indication TAPE), switch to indication SOURCE with the SOURCE/TAPE button, to enable you to check the recording level with the aid of the recording level indication.

- If you record without tape matching, turn the BIAS and CAL controls to their centre positions.

Adjusting Recording Level

- Turn the MASTER CONTROL fully right.
- Adjust the small LEVEL controls so that the 0-dB marks of the level indication just light up at the loudest points in the recording (0 dB = maximum recording level).

The recording level for the two channels can be adjusted separately to equalise different stereo levels, eg: in the case of rerecordings. In general, however, it is not advisable to change the stereo balance but to set the LEVEL controls for the same recording level using the adjustment figures.
Lighting up of the level indication above the 0-dB marks (+dB) indicates over-modulation and should only happen for very short periods.

Start Recording
by pressing the start button ▷.

Monitoring During Recording
Recordings can be monitored through an amplifier connected to the LINE OUT sockets or via the HEADPHONES socket.

Pre-Tape Monitoring (Monitor A)
To monitor the sound as it is being recorded, switch to display indication SOURCE using the SOURCE/TAPE button.

Off-Tape Monitoring (Monitor B)
To monitor the sound immediately after it is recorded, switch to display indication TAPE using the SOURCE/TAPE button.

Fading Recording In and Out

- To fade recording in: Gradually turn MASTER CONTROL from "0" to the point previously found to give correct recording level.
- To fade recording out: Gradually turn MASTER CONTROL down to "0".

For Muted Recording
hold the ○ REC/MUTE button pressed during recording. No sound will be recorded during this time, which allows eg: announcements to be faded out.

To Interrupt Recording
press the pause button ▯▯.
To restart recording press the start button ▷.

To Stop
recording press the stop button □.

MPX FILTER button
Press this button when recordings are made from an FM stereo broadcast to filter out pilot tone residuals, particularly when radio recordings are made using the DOLBY NR system.

Tape Counter

An electronic tape position counter with memory function is integrated in the display, which can be used as follows:

- Rewind the cassette to the beginning of the tape.
- Set the counter to "0000" by pressing the reset (0-SET) button.
- At the beginning of each recording note its title and the counter reading.
- On playback, set the counter again to "0000" after the cassette has been rewound to the beginning of the tape.

– Any chosen title may now be selected observing the counter reading.

The respective counter reading is retained when the unit is switched off.

Memory Function
The MEMO button enables you to enter a stopping position in the memory, which can then be called up via the rewind function (button ◁◁).

To enter in memory

- Press MEMO button: display shows MEMO.

To erase memory

- Press MEMO button again or press 0-SET button.

Example:

- Before the start of a recording, press the MEMO button; display shows MEMO.
- Start recording.
- If you do not like a number, press rewind button ◁◁.

– The recorder now winds the tape to the position (counter reading) stored in the memory. From this point you can start a new recording.

Calibration

For optimum operating point adjustment of the unit to the different tape qualities, a test CD with different test tone recordings is enclosed. The test signals required for the calibration are supplied by the tracks 5 to 9 on the CD.

Adjustment

- Prepare the test CD for copying and insert a blank cassette.
- Select the function recording/start.
- The adjustment is made by means of pre-tape and off-tape monitoring. Pre-tape means: you will hear the CD playback; off-tape means: you will hear the sound already recorded.

– Switching between pre-tape and off-tape monitoring is done with the SOURCE/TAPE button (pre-tape = indication SOURCE, off-tape = indication TAPE in the display).

1. Copying track 8 (400 Hz) of the CD:
   Adjust the LEFT CAL and CAL RIGHT controls in such a way that no difference in volume level can be noticed between pre-tape and off-tape monitoring. The 0-dB mark in the recording level display should just light up (full modulation).
2. Copying track 9 (12 kHz) of the CD:
   Adjust the LEFT BIAS and BIAS RIGHT controls in such a way that no difference in tone can be noticed between pre-tape and off-tape monitoring. The recording level display should only light up to the –10dB mark.

Operation with an External Timer

It is possible to start and stop the recording function with an external timer.

- Switch the cassette deck on with the POWER switch.

For Playback:
– Insert cassette and, if required, wind to the desired starting position.
– Use the stepping button TIMER to switch to display indication ▷ TIMER: indication flashes.

For Recording:
– Insert cassette with sufficient playing time.
– Use the stepping button TIMER to switch to display indication REC TIMER (press twice): indication flashes.

- After the respective preparations have been made, pull the mains plug.
- Set the timer to the required switch-on and switch-off times and connect the cassette deck to the timer.

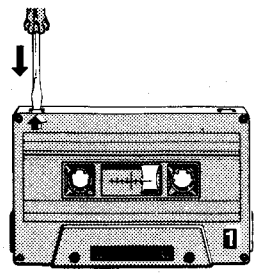
Note: To switch off the timer function prematurely, press the stepping button TIMER until the flashing TIMER function indications go out.
For normal operation of the unit, the timer function must be switched off.

Erasing and Protecting Against Accidental Erasure

Whenever a recording is made, any recording already on the tape is automatically erased. Commercially pre-recorded cassettes are protected against accidental erasure.

You can protect your own recordings against accidental erasure if you break out the appropriate record lock tab in the opening in the back edge of the cassette (eg: with a screw driver).

If you wish to make a fresh recording, simply cover the opening with a sticky tape.



Treatment of Cassettes

Never place the **cassettes** on or near radiators or any other heat source as this may damage the tape and make the cassettes unusable.

When not in use, cassettes should be placed in their containers to keep them clean and to prevent loops being formed in the tape.

Care and Maintenance

To clean the **cabinet,** only a soft cloth which picks up dust should be used. Aggressive polishing or cleaning materials may damage the surface of the cabinet.

Consistently good recording and playback will be obtained only if all parts with which the tape comes into contact, eg: pinch roller, capstan, sound head and erase head are free from tape abrasion. They should be cleaned at regular intervals as follows:

- Open cassette compartment with EJECT button ⏏ and remove an eventually inserted cassette.
- Soak a cotton wraproud in methylated spirits and clean parts making contact with tape. Do not use hard objects.

If your set developes a fault, contact your dealer.

Specification

Mains voltage/mains frequency: 220 V ~ ± 10%, 50...60 Hz (GB: 240 V, 50 Hz).

Drive: Dual-capstan drive mechanism with closed loop tape run, 2 motors with microcomputer control

Tape speed: 4.76 cm/sec. (≦ ± 1 %)

Wow and flutter (weighted): ≤ ± 0.08 %

Fast wind time: Approx. 100 seconds for a C 60 cassette

Frequency response: Cr, Me, Fe 30 Hz...20 kHz

Weighted signal/noise ratio:
(curve A, rms):

Tape type	without Dolby NR	with Dolby B-NR	with Dolby C NR
IEC I (Fe)	59 dB	68 dB	77 dB
IEC II (Cr)	60 dB	69 dB	78 dB
IEC IV (Me)	60 dB	69 dB	78 dB

Crosstalk: ≧ 45dB at 1 kHz

Channel deviation: ≦ 1 dB

Recording sensitivity:

LINE IN for full modulation 0 dB (tape flux 200 nWb/m): 105 mV, R_{in} ~ 40 kΩ.

Output voltage:

LINE OUT: Approx. 1000 mV, Ri ~ 3 kΩ.

Headphones: Variable from approx. 0 – 2 V, R_{load} ~ 120 Ω.

The technical data given above have been determined in accordance with the test specifications laid down by DIN (German Standards Institute) using the following tape batches:
Fe IEC I (R 723 DG)
Cr IEC II (U 564 W)
Me IEC IV (E 912 BH)

The unit meets BS 415 safety regulations and consequently also the international safety specifications IEC 65 or CEE 1.
The unit meets interference radiation regulations based on the EEC guidelines No. 76/899 and 82/499 EEC, BS 800: 1979, SI 1978/1267.

Subject to alteration. E. and O.E.